REMARKS

The undersigned thanks the Examiner for the suggestions for this patent application that were provided in the telephone call between the undersigned and the Examiner on June 3, 2004. In accordance with those suggestions, applicants submit herewith amendments to claims 1 and 2 and a Declaration under Rule 132 of Chien-Jen Chen, co-inventor of the patent application.

The present amendments make it clear that applicants' optical amplifier equipment has a Raman pump that provides Raman pump light at first and second Raman pump wavelengths. The Raman pump light at the first Raman pump wavelength provides Raman gain for the Raman pump light at the second Raman pump wavelength. The Raman pump light at the first and second Raman pump wavelengths can be used to make measurements without disrupting normal optical data signals traveling on a span of transmission fiber. The Raman pump light at the second wavelength is pulsed to make optical time-division multiplexing (OTDR) measurements while the Raman pump light at the first wavelength is modulated at a slower frequency to investigate the effects of different Raman pump powers at the first wavelength.

The Raman pump light at the first and second wavelengths is backscattered from the transmission fiber. A

first wavelength-division-multiplexing coupler separates the backscattered light at the first and second wavelengths from the optical data signals. After the separated backscattered light passes through a circulator, a second wavelength-division-multiplexing coupler is used to separate the backscattered Raman pump light at the second wavelength from the backscattered Raman pump light at the first wavelength to make accurate OTDR measurements from the pulses of light at the second wavelength. The first wavelength-division-multiplexing coupler is included in the optical data path, but the second wavelength-division-multiplexing coupler is cascaded with the first wavelength-division-multiplexing coupler out of the main optical data path, so degradation of the optical data signals due to insertion of components into the optical data path is minimized.

Applicants' invention therefore allows accurate OTDR measurements to be made in multi-wavelength Raman pump equipment without introducing undesirable optical losses from additional in-line taps and couplers. As made clear from the Chen declaration, the ability to make OTDR measurements with applicants' minimally disruptive arrangement is not taught by the prior art.

The Ghera system has equipment 170 that can be used to make measurements of backscattered Raman pump light from Raman pump 120. However, only a single wavelength-division-

multiplexing coupler 260 is used to separate backscattered Raman pump light from fiber 110, so it is not possible to use Ghera's equipment 170 to separate backscattered Raman pump light at a second wavelength from backscattered Raman pump light at a first wavelength.

Park and the other cited prior art references fail to make up for the deficiencies of Ghera. In particular, Park shows an optical measurement arrangement for backscattered Raman pump light that uses a wavelength-insensitive tap 420, rather than a wavelength-division-multiplexing coupler. Park therefore fails to suggest modification to Ghera to use applicants' claimed cascaded wavelength-division-multiplexing coupler arrangement.

The foregoing demonstrates that claims 1 and 2 are in condition for allowance. Reconsideration of this patent application and allowance are respectfully requested.

Respectfully submitted,

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